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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/664,681	09/19/2003	Demetri Psaltis	P397-US	4072

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Steinfl & Bruno
301 N Lake Ave Ste 810
Pasadena, CA 91101

EXAMINER	
LAMB, CHRISTOPHER RAY	
ART UNIT	PAPER NUMBER
2627	
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10/18/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/664,681	PSALTIS ET AL.	
	Examiner	Art Unit	
	CHRISTOPHER R. LAMB	2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 July 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-6 and 10-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-6 and 10-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 3-6, and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glushko et al. (US 6,291,132) in view of Bawendi et al. (US 6,774,361), and further in view of Fuller et al. ("Ink-Jet Printed Nanoparticle Microelectromechanical Systems," Journal of Microelectromechanical Systems, Vol. 11, No. 1, February 2002, disclosed in IDS).

Regarding claim 1:

Glushko discloses:

A method of storing data comprising:

placing a plurality of fluorescent elements at each of a plurality of data pit locations on a rotating data storage medium to represent data (column 12, lines 35-50);

exciting said fluorescent elements at each location by making them fluoresce (column 12, line 50 to column 13, line 5);

measuring said fluorescence of said fluorescent elements at each location to identify presence and absence (column 13, line 45-65).

Glushko does not disclose:

(A) wherein said fluorescent elements are:

nanometer beads filled with nanometer sized particles, the nanometer sized particles providing colors to the nanometer beads;

where it is the colors within said beads that are excited and the presence and absence of said colors that is identified, and

wherein the presence or absence of a color represents a bit of data.

(B) wherein the nanometer beads are placed using inkjet technology.

Regarding (A):

Bawendi discloses:

fluorescent elements that are nanometer beads filled with nanometer sized particles (column 14, lines 15-50), the nanometer sized particles providing colors to the nanometer beads (column 6, lines 25-65);

where it is the colors within said beads that are excited and the presence and absence of said colors that is identified (e.g., column 5, lines 45-65);

wherein the presence of absence of a color represents a bit of data (column 5, lines 45-60; column 9, line 55 to column 10, line 25).

It would have been obvious to one of ordinary skill in the art at the time of the invention to include in Glushko wherein the fluorescent elements are nanometer beads filled with nanometer sized particles, the nanometer sized particles providing color to the nanometer beads, as taught by Bawendi, where it is the colors within said beads that are excited and the presence and absence of said colors that is identified, and the presence or absence of a color represents a bit of data.

The rationale is as follows:

Both Glushko and Bawendi are directed to using fluorescent materials to record information.

Glushko discloses using fluorescent dye to record information.

Bawendi specifically discusses using fluorescent dyes to store information (column 3, lines 5-15) and discloses that quantum dots are superior (column 3, lines 5-40).

One of ordinary skill could have combined the known improvement taught by Bawendi with the disclosure of Glushko and achieved predictable results.

Regarding (B):

Glushko in view of Bawendi does not disclose wherein the nanometer beads are placed using inkjet technology.

Fuller discloses wherein nanometer beads are placed using inkjet technology (page 54: last two paragraphs).

It would have been obvious to one of ordinary skill in the art to include in Glushko in view of Bawendi wherein the nanometer beads are placed suing inkjet technology.

The rationale is as follows:

Fuller demonstrates that inkjet technology is a known method for depositing nanometer beads. Fuller discloses that is advantageous (page 54).

One of ordinary skill could have combined the teaching of Fuller with that of Glushko in view of Bawendi and achieved predictable results.

Regarding claim 3:

Glushko in view of Bawendi, and further in view of Fuller, discloses:

wherein said nanometer sized particles are nanometer sized fluorescent particles (taught by Bawendi as discussed above).

Regarding claim 4:

Glushko in view of Bawendi, and further in view of Fuller, discloses:

wherein said nanometer sized particles comprise quantum dots (taught by Bawendi as discussed above).

Regarding claim 5:

Glushko in view of Bawendi, and further in view of Fuller, does not explicitly disclose:

wherein said quantum dots are made up of red, blue, and green color.

However, it would have been obvious to one of ordinary skill in the art at the time of the invention to include in Glushko in view of Bawendi, and further in view of Fuller, wherein said quantum dots are made up of red, blue, and green colors.

The rationale is as follows:

Bawendi teaches that the quantum dots are made up of multiple colors (each "discrete emission" of column 6, lines 45-55 is a separate color).

There is a finite set of colors, of which red, blue and green are prominent examples. One of ordinary skill could have pursued the known potential solutions and chosen red, blue, and green with a reasonable expectation of success.

Regarding claim 6:

Glushko in view of Bawendi, and further in view of Fuller, discloses:

wherein said quantum dots are made of a plurality of shades of a color (column 6, lines 45-55: if there may be twenty separate discrete emissions at least some must be a plurality of shades of a color, since there are less than twenty major colors).

Regarding claim 12:

Glushko in view of Bawendi, and further in view of Fuller, discloses:

wherein placing a plurality of nanometer beads at each of a plurality of data pit locations comprises placing a plurality of said nanometer beads in each data pit location, the nanometer sized particles providing colors to each nanometer bead, wherein the beads placed in a same data pit location are different from one another (Bawendi teaches using a group of quantum dots of "one or more" sizes, as per column 9, line 58 to column 10, line 15. Each size dot is a different color).

Regarding claim 13:

Glushko in view of Bawendi, and further in view of Fuller, discloses:

wherein the beads placed in the same data pit location are colored with different colors (as per the discussion in the rejection of claim 12).

Regarding claim 14:

Glushko in view of Bawendi, and further in view of Fuller, discloses:

wherein the beads placed in the same data pit location are colored with different shades of a color (as discussed in the rejection of claim 6).

3. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Glushko in view of Bawendi, and further in view of Fuller, as applied to claim 1 above, and further in view of Metz (US 5,166,813).

Regarding claim 10:

Glushko in view of Bawendi, and further in view of Fuller, discloses a method for storing data as discussed above in the rejection of claim 1.

Glushko in view of Bawendi, and further in view of Fuller, does not disclose "wherein a HSMF is used for dispersing collimated fluorescent light on a spectrally sensitive component."

Metz discloses that when detecting fluorescence, a holographic multi-spectral filter is used for dispersing collimated fluorescent light on a spectrally sensitive component (the abstract discloses the use of a holographic filter; Fig. 1 depicts the light impacting the spectrally sensitive component; column 12, lines 40-50 discloses that the hologram can be multi-spectral: that is, it transmits more than one wavelength). Metz discloses that a holographic filter is more efficient (column 13, lines 1-15).

It would have been obvious to one of ordinary skill at the time of the invention to include in Glushko in view of Bawendi, and further in view of Fuller a holographic multi-spectral filter as taught by Metz.

The combination would have been predictable to one of ordinary skill in the art; the motivation would have been to be more efficient.

4. Claims 11 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glushko in view of Bawendi, and futher in view of Wenzel ("Shaping nanoparticles and their optical spectra with photons," Applied Physics B, pags 513-517, October 20th, 1999; cited in applicant's specification).

Regarding claim 11:

This claim is identical to claim 1 except that the nanometer beads are placed "using laser-induced technology."

As above, the base reference Glushko does not teach the nanometer beads or the means of placing them.

The nanometer beads are taught by Bawendi; the analysis was discussed in detail in the rejection of claim 1.

Regarding the means of placing the beads:

Glushko in view of Bawendi does not disclose wherein they are placed "using laser-induced technology."

Wenzel discloses using laser-induced technology to place quantum dots (e.g., Conclusions, page 516).

It would have been obvious to one of ordinary skill in the art to include in Glushko in view of Bawendi wherein the nanometer beads are placed using laser-induced technology.

The rationale is as follows:

Wenzel teaches a known technique to place nanoparticles.

One of ordinary skill in the art could have combined it with the teaching of Glushko and Bawendi and achieved predictable results.

Regarding claims 15-17:

These claims are similar to claims 12-14. These elements in Bawendi were identified in the rejection of those claims and do not change in the combination used for these claims. No further elaboration is necessary.

Response to Arguments

5. Applicant's arguments filed July 21st, 2010 have been fully considered but they are not persuasive.

Applicant's arguments are directed at the teaching of Bawendi. Applicant argues that Bawendi does not teach "to represent data by the presence and absence of said colors."

Specifically, applicant first argues that Bawendi teaches analyzing the presence of a color but not its absence.

However, Bawendi does teach identifying the presence or absence of a color. Bawendi clearly teaches representing data by the presence or absence of a particular quantum dot (i.e., the absence of a color). See, for example, column 10, lines 1-15, e.g., "In the case of M=2 where the two states could be the presence or absence of the quantum dot..."

It's important to remember that each specific size of quantum dot produces one color. So here when Bawendi detects the presence or absence of a quantum dot by analyzing its spectral emission, Bawendi is detecting through spectral analysis the presence or absence of that color.

Next, applicant states that "analyzing a plurality of spectral emissions has nothing to do with 'to represent data by the presence and absence of said colors.'"

Applicant may be confused because Bawendi uses slightly different terminology than applicant does. To clarify, analyzing a spectral emission means to analyze the frequency of the electromagnetic radiation emitted by a sample. Each color is a different

frequency of electromagnetic radiation. Therefore, analyzing the spectral emission is analyzing the colors. Bawendi clearly shows (as per the previous discussion) that the absence of a quantum dot can be used to represent information, and therefore by analyzing the spectral emission Bawendi is disclosing analyzing the colors to determine which are present and which are absent.

Finally, applicant argues that Bawendi does not teach that “the presence of absence of a color represents a bit of data.” As per the earlier discussion, Bawendi teaches exactly this. By "M=2" in the previous discussion, Bawendi is indicating that the presence or absence of a quantum dot -- i.e., the presence or absence of a color -- can represent two states, or one bit of data.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER R. LAMB whose telephone number is (571) 272-5264. The examiner can normally be reached on 9:00 AM to 5:30 PM Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Feild can be reached on (571) 272-4090. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Christopher R Lamb/
Primary Examiner, Art Unit 2627